UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,244	07/18/2003	Keat Ghee Ong	Sent-100A	3268

28304 7590 04/06/2007

JEAN M. MACHELEDT
501 SKYSAIL LANE
SUITE B100
FORT COLLINS, CO 80525-3133

EXAMINER	
DANG, HUNG Q	
ART UNIT	PAPER NUMBER
2612	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/06/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/622,244	ONG ET AL.	
	Examiner	Art Unit	
	Hung Q. Dang	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *7/18/2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 15-29* is/are rejected.

7)☒ Claim(s) *14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *7/18/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Objection

1. Claim 19 is objected to because of the following informalities: "on" on line 3 of claim 19 should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 2, 17 and 25 are rejected under 35 U.S.C. 102(b) as being anticipated by Brady et al. U.S. Patent 5,303,207.

Regarding claim 1, Brady et al. teaches a network of remote sensing node assemblies, a first and second of which each has a sensor element, the network (See figure 1) comprising:

(a) each of the sensor elements (Figure 1, units 16a-c are contain sensor elements; column 4 lines 38-52) adapted for immersion within a liquid environment for sensing therewithin;

b) each respective one of the first and second node assemblies to comprise: a source of power (inherent) for said respective node assembly, and a transducer for receiving acoustic waves transmitted from a different one of the node assemblies while

immersed within said liquid environment, said transducer further adapted for emitting, for transmission through said liquid environment, sensor information collected about said liquid environment by the sensor element of said respective node assembly (column 4, lines 38-60); and

(c) a third node assembly adapted for receiving and processing said sensor information acoustically transmitted from each said respective node assembly (Figures 1 and 2, any of the units 14 and unit 12 can be a 3rd node).

Regarding claim 2, each of the node of the network disclosed by Brady et al also comprises:

a) acoustic-transducer circuitry (Figure 2 shows nodes 14 has a acoustic transducer 30 and 32; and column 4 lines 38-41 indicates that nodes 16a-c comprises acoustic modems which converts acoustic waves into signal and vice versa) for converting said acoustic waves received by said respective node assembly, into signal; and

b) a controller (Figure 3 and column 5 lines 60-67 shows that unit 42 is the node controller for each of the nodes 14) adapted for local processing of said signals within said respective node assembly, said local processing comprises converting said signals into modulated signals for said emitting by said transducer (Also column 4 lines 38-52 indicates the existence of an acoustic modem for nodes 16 for converting acoustic waves into signals and vice versa).

Claim 17 is rejected for the same reasons as the rejection of claim 1.

Claim 25 is rejected for the same reasons as the rejection of claim 1. The claimed first, second and third program sub-codes are inherently required for carrying out data conversion/processing/modulation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8-13, 15, 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brady et al. U.S. Patent 5,303,207 in view of Tubel U.S. Pub. 2002/0020533.

Regarding claims 8 and 15, Brady et al. also teaches a third node assembly (Figure 1, any node 14 can be a 3rd node) comprising means (Figure 2, unit 26) for transmitting sensor information to a remote host (Figure 1, unit 12); and said host is adapted for communicating with an **observer** on the shore, **instead** of communicating with a **computerized device** having an interface adapted for accessing said sensor information as a compilation of sensing data.

Tubel teaches a network of remote sensing node assemblies (Figure 1), which comprises a remote host (Figure 1, unit 24 is the remote host; paragraph [0070]) being adapted for communicating with a **computerized device** at the shore (Figure 1 and

paragraph [0088], unit 10 is the computerized device) having an interface adapted for accessing said sensor information as a compilation of sensing data (paragraph [0088]).

Since both of the networks concern wireless communication from a remote distance from the shore, and Tubel further disclose data communication from an offshore remote host to computerized device on the shore for data accessing and compilation on the shore, therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide an onshore computerized device adapted for communicating with the remote host of the network disclosed by Brady et al., as suggested by Tubel, so that offshore sensed data can be transmitted to an onshore computerized device for data accessing and compilation.

Regarding claim 9, the 3rd node assembly (Figure 1, any of the units 14) disclosed by Brady et al. also comprises an acoustic transducer (Figure 2, units 30 and 32) adapted for receiving while immersed in said liquid environment; and means for transmitting (Figure 2, unit 26) sensor information to said remote host. Regarding part (b) of claim 9, Brady et al. also teaches transmitting sensor information to the remote host using RF transmission (figure 10, unit 146 indicates RF transmission).

Regarding claim 10, claim 10 is rejected for the same reasons as the rejections of claims 1 and 8. Regarding part (d) of claim 10, the examiner interprets unit 12 in figure 1 of Brady et al. as the 3rd node and unit 18 as the remote host. Clearly from figure 1, the transmitting means 12 transmits sensor information to the remote host when not immersed in the aqueous body.

Regarding claims 11-13, claim 11 is similarly rejected for the same reasons as the rejection of claim 8; **except** that Brady et al. does not specifically teach **broadcasting** message to each of the respective node assembly within an acoustic transmission range instructing a respective sensor element of said respective node assembly to perform said sensing.

In column 5 lines 25-34, Brady et al. discloses that said nodes may operate in both standby power conservation mode or a power up mode, which, to one of ordinary skill in the art, suggests that said nodes can be in the standby power conservation mode or in a power up mode when said nodes are interrogated or powered up by a broadcast message. This broadcasting method has been commonly used in wireless transmission networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide broadcasting message(s) to each of the respective node assembly disclosed by Brady et al. within an acoustic transmission range instructing a respective sensor element of said respective node assembly to perform said sensing, so that power can be saved.

Regarding claim 21, claim 21 is rejected for the same reasons as the rejections of claim 9 part (b) and claim 11 part (c).

Regarding claim 27, parts (a) and (b) (regarding signal broadcasting) of claim 27 are rejected for the same reasons as the rejection of claim 11. Parts (c)-(f) of claim 27 basically further claim a fourth and fifth sensor node assemblies and instruction code for carrying out acoustic signal emission from the 5th node to the 2nd node to the 1st node and finally to the 3rd node, which is known to one of ordinary skill in the art as

multi-node hopping. According to figure 5 of Brady et al., the examiner interprets nodes 16a and 16b as the 4th and 5th node, respectively; node 14d as the 2nd code; node 14e as the 1st node and node14a as the 3rd node. Therefore, the teaching of Brady et al. as shown in figure 4 meets the claimed limitations parts (c)-(f) of claim 27.

6. Claims 3-7, 16, 18-20, 22-24, 26, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brady et al. U.S. Patent 5,303,207.

Regarding claims 3 and 4, the examiner takes official notice encoded signals have been conventionally represented in term binary (high/low voltage pulses). The examiner also takes official notice that signal amplification has been conventionally employed in signal processing system to achieve strong transmit signal and clear receive signal. Therefore, it would have been obvious to one skill in the art at the time the invention was made to provide the above-indicated signal processing techniques to the network disclosed by Brady et al. for the indicated reasons.

Regarding the claimed plurality of directional transducers and an omni-directional transducer, one skilled in the art would recognize that for optimal acoustic signal reception, an acoustic transducer should be equipped as a multi-directional transducer(s) or an omni-directional transducer depending on the number of surrounding acoustic emitting source(s). Therefore, it would have been obvious to one skilled in the art to provide the claimed transducer(s) merely depending on the surrounding acoustic signal emitting source(s).

Regarding claim 5, parts (a) and (b) of claim 5 (regarding signal conversion into a series of voltage pulses) are rejected for the same reasons as the rejection of claim 3. Regarding part (c) of claim 5, the 3rd node disclosed by Brady et al. also includes a processor (column 8 lines 4-8 indicates the existence of a processor) adapted for said third node processing, and means (Figure 2, modem 26) for transmitting said sensor information from said 3rd node assembly to a remote host (Figure 1, unit 12).

Regarding claim 6, the 3rd node assembly disclosed by Brady et al. also comprises an acoustic transducer (figure 2, units 30 and 32) adapted for said receiving while immersed in said liquid environment. Regarding part (b) of claim 6, Brady et al. also teaches transmitting sensor information to the remote host using RF transmission (Figure 10, unit 146 indicates RF transmission).

Regarding claim 7, ad mentioned above, Brady et al. teaches the network of claim 7, except parts (a). Regarding part (a) of claim 7, the examiner takes official that the claimed modulation techniques have been conventionally employed in wireless communication systems. Therefore, by conventionality, it would have been obvious to one skilled in the art to provide any of the claimed modulation technique, depending on the type of transmission being used, to the communication network disclosed by Brady et al.; Regarding part (b), part (b) is rejected for the same reasons as the rejection of claim 4.

Claim 18 is rejected for the same reasons as the rejection of claim 7.

Claim 19 is partially rejected for the same reasons as the rejections of claims 1 or 17 and 8. Regarding part (a) of claim 19, from figure 5 of Brady et al. the first or second signals can be emitted from the first node 16a to the 3rd node 14a.

Regarding claim 20, parts (a) and (b) of claim 20 are rejected for the same reasons as the rejection of claim 8. Brady et al. also teaches converting received modulated signals into electromagnetic signals having a frequency greater than 3 kHz (Figure 10, unit 144 indicates VHF electromagnetic signal transmission; VHF stands for Very High Frequency. According to the standardized frequency chart, VHF signals have frequency higher than 3 kHz).

Claims 24, 28 and 29 are rejected for the same reasons as the rejections of claims 17 and 20. The claimed conversion of signal into voltage pulses in claim 29 is rejected for the same reasons stated in the rejection of claim 3 or 4.

Claim 26 is rejected for the same reasons as the rejection of claim 18 (regarding the signal conversion into a series of voltage pulses).

Regarding claim 23, Brady et al. does not specifically teach **broadcasting** message to each of the respective node assembly within an acoustic transmission range instructing a respective sensor element of said respective node assembly to perform said sensing.

In column 5 lines 25-34, Brady et al. discloses that said nodes may operate in both standby power conservation mode or a power up mode, which, to one of ordinary skill in the art, suggests that said nodes can be in the standby power conservation mode or in a power up mode when said nodes are interrogated or powered up by a broadcast

message. This broadcasting method has been commonly used in wireless transmission networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide broadcasting message(s) to each of the respective node assembly disclosed by Brady et al. within an acoustic transmission range instructing a respective sensor element of said respective node assembly to perform said sensing, so that power can be saved.

Parts (a)-(d) of claim 23 basically further claim a fourth and fifth sensor node assemblies and instruction code for carrying out acoustic signal emission from the 5th node to the 2nd node to the 1st node and finally to the 3rd node; and also, from the 4th node to the 3rd node, which is known to one of ordinary skill in the art as multi-node hopping. According to figure 5 of Brady et al., the examiner interprets nodes 16a and 16b as the 4th and 5th node, respectively; node 14d as the 2nd code; node 14e as the 1st node and node14a as the 3rd node. Therefore, the teaching of Brady et al. as shown in figure 4 meets the claimed limitations parts (a)-(d) of claim 23.

Claim 16 is similarly rejected for the same rejection as the rejection of claim 1. Except that claim 16 further claims a second sensor within each sensor node for sensing information about a **non-liquid** environment. Brady et al., in column 10 lines 37-40, discloses that the sensors in the plurality of sensor stations of Brady et al. can be a seismometer. A seismometer is known for measuring the direction, intensity, and duration of earthquakes by measuring the actual movement of the ground. Therefore, it would have been obvious to one of ordinary skill in the art to further provide a 2nd sensor, such as a seismometer, to the sensor nodes disclosed by Brady et al. to

measure the direction, intensity, and duration of earthquakes by measuring the actual movement of the ground.

The sensor nodes disclosed by Brady et al. also comprises an anchor connection (Figure 1, unit 22) releasable to the sensor nodes.

Claim 22 is rejected for the same reasons as the rejections of claim 3 (regarding voltage pulse) and claim 16 (regarding sensing non-liquid information).

Allowable Subject Matter

7. Claim 14 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 14, the prior arts of record fail to teach the network as disclosed in claim 14, which further comprises upon receiving any node message, the computerized device is adapted for generating an alert-type message for transmission by the remote host to the 3rd node assembly instructing the respective node assemblies to decrease an interval time between each successive of said periodic activation.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Q. Dang whose telephone number is (571) 272-3069. The examiner can normally be reached on 9:30AM-6PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on (571) 272-7308. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Hung Q Dang
4/1/2007
H.D.

BRIAN ZIMMERMAN
PRIMARY EXAMINER